

4 Jan 02

EPLY TO  
TTENTION OF

DEPARTMENT OF THE ARMY  
OFFICE OF THE CHIEF OF STAFF  
200 ARMY PENTAGON  
WASHINGTON DC 20310-0700

30 DEC 1998

DACS-SF

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Revised Policy for the Use of NIOSH-Certified Commercial Respirators with Chemical Agents

1. Reference:

- a. AR 50-6, Chemical Surety, 1 Feb 95.
- b. AR 385-61, The Army Chemical Agent Safety Program, 28 Feb 97.
- c. DA Pam 385-61, Toxic Chemical Agent Safety Standards, 31 Mar 97.
- d. DACS-SF memorandum dated 11 Sep 96, subject: Policy for the Use of NIOSH-Certified Commercial Respirators with Chemical Agents.
- e. SCBRD-ODR-S memorandum dated 15 May 1995, subject: Commercial Chemical Protective Clothing - Guidance for Preparing a Request.
- f. DACS-SF memorandum dated 7 May 1998, subject: Preparing a Request to Use Commercial Environmental Protection Agency Level B Clothing for Chemical Agent Operations.

2. In order to comply with Federal, Department of Defense, and Army safety and health standards, a policy was developed and issued in 1996 to allow the use of NIOSH-certified commercial, full-facepiece respirators for industrial operations in which the potential for personnel exposure to chemical agents (as defined in reference 1 a) may exist (reference 1 d). The intent of this policy is to allow users to tailor their requirements and select the best available respiratory protection. Approval for the use of NIOSH-certified commercial, full-facepiece respirators gives Army commanders, contractors, and others more options to address the variety of chemical hazards that may exist both on and off Army installations. This policy does not prevent the use of existing Army protective masks.

3. The test plan contained in the 1996 policy has been revised by the Army Materiel Command's Chemical Agent Safety and Health Policy Action Committee (CASHPAC) Respirator Joint Working Group (JWG) and is enclosed. The revised test plan has been reviewed by and concurrence received from the Office of the Surgeon General,

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the U.S. Army Medical Command, the U.S. Army Soldier and Biological Chemical Command, and the U.S. Army Nuclear and Chemical Agency. As with the 1996 policy, industrial chemicals, such as chlorine, phosgene, cyanogen chloride, and hydrogen cyanide, are not within the scope of this policy. This policy is for respiratory protection in areas where exposure to chemical agent vapor or liquid is possible but is not expected. This revised policy applies to respirators only. Protective clothing will be as specified in references I b and 1c. Procedures for requesting approval of commercial protective clothing are delineated in references 1e and 1f.

4. Requests for use of NIOSH-certified commercial respirators with chemical agents will be submitted for approval to the Office of the Director of Army Safety, ATTN: -DACCS-SF, 200 Army Pentagon, Washington, DC 20310-0200, with a copy furnished to the Technical Director, Edgewood Chemical Biological Center, ATT: SCBRD-ODR-S, Aberdeen Proving Ground, MD 21010-5423 for review. Requests must include all required information (e.g., test data and use scenario).

5. In order to prevent duplication of testing, the Edgewood Chemical Biological Center will maintain a file of respirator test results. Before testing, users should contact the Edgewood Chemical Biological Center Safety/Surety Office to determine what testing has already been performed for a particular respirator or if the respirator has already been approved for a specific use scenario.

6. This memorandum supercedes the 11 Sep 96 policy memorandum on this subject. Point of contact for this action is Mr. Jim Patton, 703/695-7294.

Encl

JAMES A. GIBSON  
Senior Safety Manager  
Office of the Director of Army Safety

## DISTRIBUTION:

Commander in Chief, U.S. Army, Europe and Seventh Army, ATTN: AEAGA-S,  
Heidelberg, FRG, APO AE 09014

The Inspector General, ATTN: SAIG-ID, 1700 Army Pentagon, Washington, DC  
20310-1700

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DISTRIBUTION, cont.

Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health), 110 Army Pentagon, Washington, DC 20310-0110

Deputy Chief of Staff for Operations, ATTN: DAMO-SSD, 400 Army Pentagon, Washington, DC 20310-0400

Assistant Chief of Staff for Installation Management, Office of the Director of Environmental Programs, ATTN: DAIM-ED, 600 Army Pentagon, Washington, DC 20310-0600

Project Manager for Chemical *Stockpile Disposal*, ATTN: SFAE-CD-SQ, Aberdeen Proving Ground, IVID 21010-5401

Project Manager for Non-Stockpile Chemical Materiel, ATTN: SFAE-CD-N, Aberdeen Proving Ground, MD 21010-5401

Project Manager for Chemical Demilitarization, JACADS Field Office, ATTN: Safety Office, APO AP 9655MOO8

Chief, National Guard Bureau, Army Aviation and Safety Directorate, Arlington Hall Readiness Center, ATTN: NGB-AVN-S, 111 South George Mason Drive, Arlington, VA 22204-1382

Commander:

U.S. Forces Command, ATTN: AFPI-SO, Fort McPherson, GA 30330-6000

U.S. Army Materiel Command, ATTN: AMCCB, 5001 Eisenhower Avenue, Alexandria, VA 22333-0001

U.S. Army Materiel Command, ATTN: AMCSF, 5001 Eisenhower Avenue, Alexandria, VA 22333-0001

U.S. Army Soldier and Biological Chemical Command, ATTN: AMSBC-RA, Aberdeen Proving Ground, MD 21010-5423

U.S. Army Soldier and Biological Chemical Command, ATTN: AMSBC-SO, Aberdeen Proving Ground, MD 21010-5423

Anniston Chemical Activity, ATTN: SCBAN-CO, Anniston, AL 36201-4199

Blue Grass Chemical Activity, ATTN: SCBBG-CO, Building S-56, 2091 Kingston Highway, Richmond, KY 40475-5008

Deseret Chemical Depot, ATTN: SCBDE-CO, Tooele, UT 84074-5000

Dugway Proving Ground, ATTN: SCBDP-CO, Dugway, UT 84022-5000

Edgewood Chemical Activity, ATTN: SCBAB-CO, Aberdeen Proving Ground, MID 21010-5423

Newport Chemical Depot, ATTN: SCBNE-CO, Newport, IN 47966-0121

Pine Bluff Chemical Activity, ATTN: SCBPB-CO, Pine Bluff, AR 71602-9500

Pueblo Chemical Depot, ATTN: SCI3PU-CO, Pueblo, CO 81001-5000

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DISTRIBUTION, cont.

Umatilla Chemical Depot, ATTN: SCBUL-CO, Hermiston, OR 97838-9544  
Technical Escort Unit, ATTN: SCBTE-CO, Aberdeen Proving Ground, MD 21010-5423  
U.S. Army Industrial Operations Command, ATTN: AMSIO-SMA, Rock Island, IL 61299-6000  
U.S. Army Industrial Operations Command, ATTN: AMSIO-DMU, Rock Island, IL 61299-6000  
U.S. Army Industrial Operations Command, ATTN: AMSIO-IOA-A, Rock Island, IL 61299-6000  
U.S. Army Test and Evaluation Command, ATTN: AMSTE-SI-SU, Aberdeen Proving Ground, MD 21005-5055  
U.S. Army Garrison Aberdeen Proving Ground, ATTN: STEAP-LO-S, Aberdeen Proving Ground, MD 21005-5001  
U.S. Army Garrison Aberdeen Proving Ground, ATTN: STEAP-PF-S, Aberdeen Proving Ground, MD 21005-5001  
U.S. Army Space and Strategic Defense Command, ATTN: 6SSD-SA-S, PU Box 1500, Huntsville, AL 35807-3801  
U.S. Army Corps of Engineers, ATTN: CESO-ZA, WASH DC 20314-1000  
U.S. Army Training and Doctrine Command, ATTN: ATBO-S, Fort Monroe, VA 23651-5000  
U.S. Army Nuclear and Chemical Agency, ATTN: MONA-CM, 7150 Heller Loop, Suite 101, Springfield, VA 22150-3198  
U.S. Army Chemical School, ATTN: ATZN-CM-P, Fort McClellan, AL 36205  
U.S. Army Military Traffic Management Command, ATTN: MTCS-SO, 5611 Columbia Pike, Falls Church, VA 22041-5050  
U.S. Army Medical Command, ATTN: MCSM, Fort Sam Houston, TX 78234-6000  
U.S. Army Center for Health Promotion and Preventive Medicine, ATTN: MCHB-TS-OFS, Aberdeen Proving Ground, MD 21010-5422  
Eighth U.S. Army, ATTN: EASF, Seoul, Korea, APO AP 96205-0009  
U.S. Army Pacific, ATTN: APPE-SA, Fort Shafter, Honolulu, HI 96858-5100  
U.S. Army Pacific, ATTN: APOP-NC, Fort Shafter, Honolulu, HI 96858-5100  
U.S. Army Pacific, ATTN: APLG-MUS, Fort Shafter, Honolulu, HI 96858-5100  
U.S. Army Chemical Activity, Pacific, ATTN: APCA-ORM-0, APO AP 96558-0008  
U.S. Army Military District of Washington, ATTN: ANOS. Bldg. 41, Fort Leslie J. McNair, Washington, DC 20319-5050  
U.S. Army South, ATTN: SOSF, APO AA 34004-5000  
U.S. Army Special Operations Command, ATTN: AOOS, Fort Bragg, NC 28307-5200  
U.S. Army Intelligence and Security Command, ATTN: IAPER-HS, 8825 Beulah Street, Fort Belvoir, VA 22060-5246

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DISTRIBUTION: cont.

U.S. Army Criminal Investigation Command, ATTN: CISP-SA, 5611 Columbia Pike,  
Falls Church, VA 22041-5015

U.S. Army Safety Center, ATTN: CSSC-Z. Fort Rucker, AL 36362-5363

Director:

Edgewood Chemical Biological Center, ATTN: SCBRD-ODR-S,  
Aberdeen Proving Ground, MD 21010-5423

U.S. Army Technical Center for Explosives Safety, ATTN: SIOAC-ES, McAlester, OK  
74501

U.S. Army Defense Ammunition Center, ATTN- SIOAC-DO, McAlester, OK 74501

U.S. Army Defense Ammunition Center, ATTN: SIOAC-ASP, McAlester, OK 74501

U.S. Army Defense Ammunition Center, ATTN: SIOAC-DE, Savanna, IL 61074-9639

U.S. Army Defense Ammunition Center, ATTN: SIOAC-AV, Savanna, IL 61074-9639

U.S. Army Materiel Command Surety Field Activity, ATTN: AMXSA, Aberdeen Proving  
Ground, MD 21010-5423

COMMERCIAL RESEIRATOR TEST MATRIX

Only NIOSH-certified commercial, full-facepiece respirators may be submitted for authorization to be used in operations where contact with chemical agents (defined in Army Regulation 50-6) is possible. Respirators that are not NIOSH-certified will not be considered. The most conservative NIOSH/OSHA/ANSI assigned protection factors will apply. Commercial respirators may only be authorized for use in low-level chemical agent concentrations. The maximum use concentration (MUC) will be the airborne exposure limit (AEL) multiplied by the assigned protection factor. The MUC for mustard and lewisite will not exceed the assigned AEL's (0.003 mg/m<sup>3</sup>).

Air-purifying respirators that are to be used in areas where contact with nerve, mustard, or lewisite agents is possible must undergo the following test.

**Section A. Test Plan for Agent Gas Life Testing of Commercial Organic Vapor Air-Purifying Respirator Filters**

1. The test plan described herein is for the qualification testing of commercial organic vapor and combination air-purifying respirator filters for use in industrial-based operations involving potential exposure to chemical agents (as defined in AR 50-6). Organic vapor/acid gas filters used for mustard and lewisite operations must comply with the following testing.
2. The nerve agent simulant, dimethyl methylphosphonate (DMMP), shall be used as the challenge chemical. Test requirements are outlined in Table 1.

Table 1. DMMP Gas Life Test Requirements

Challenge Concentration (mg/m <sup>3</sup> ) <sup>a</sup>	Temperature (OCI)	Relative Humidity (M)	Test Condition	Sample Size
200+/-15	25+/-3	50+/-5	As-Received	22
200+/-15	25+/-3	50+/-5	Preconditioned <sup>a</sup>	22

<sup>a</sup> Air, at 25 +/- 3 °C and 85 +/- 5% RH, passed through each filter for 16 hours

3. Test conditions:

- a. Bench tests shall be made on an apparatus that allows the test atmosphere as

described in Table 1 to enter the filters continuously at airflow rates specified herein, and that has means for determining the test life of the filters. Data shall be provided that demonstrates the test system is capable of accurately measuring the DMVIP break point concentration at the effluent side of a filter.

b. Twenty-two filters shall be removed from their containers and tested as is (19a received" filters).

c. Twenty-two filters shall be equilibrated at  $25 \pm 3$  °C by passing  $85 \pm 5$  % relative humidity air at  $\pm 50$  % of the test airflow rate through the filters for 16 hours ("preconditioned" filters).

d. All preconditioned filters shall be capped/resealed and placed in airtight plastic bags for storage, kept in an upright position, at room temperatures, and tested within 18-48 hours.

e. All axial-flow filters shall be tested such that the direction of airflow is parallel to the floor.

f. The following continuous airflow rates shall be used to test individual filters:

- 1) 32 lpm for air purifying respirators with dual filters
- 2) 64 lpm for air purifying respirators with a single filter
- 3) 64 lpm for powered air-purifying respirators with dual filters certified at 4 cfm
- 4) 85 lpm for powered air-purifying respirators with dual filters certified at 6 cfm (loose fitting hood/helmets only)

NOTE: Some respirators may use filter configurations that differ from those specified above. In every case, the test airflow rate shall be equivalent to the flow through each filter when the respirator is operated at its maximum certified and/or approved flow rate.

g. Minimum DMMP gas life shall be 60 minutes. The test shall be stopped after 60 minutes or at the break point (break-through time), whichever occurs first. The break point shall be the time needed to attain an effluent concentration of 0.0001 mg/m<sup>3</sup>.

h. DMMP test reagent shall be a minimum of 96% purity. DMMP may be purchased from Albright and Wilson, Americans, P.O. Box 26229, Richmond, VA 23260 or Aldrich Chemical Co., Inc., P.O. Box 2060, Milwaukee, WI 53201.

### ***Section B. Other Considerations***

#### **1. Chemical Protective Hood:**

Use scenarios involving potential exposure to liquid chemical agents (or to chemical

agent vapors above the airborne exposure limit (AEL)), shall require the respirator to be worn with a hood resistant to chemical agents. The hood shall be constructed of agent resistant material(s) and be fully compatible with the respirator. The inlets of the filters may not be covered by the hood material. Hoods previously approved by the U.S. Army for chemical agent operations may be used if demonstrated to be compatible with the respirator under review and with conditions likely to be encountered by the worker, as per the use scenario. Hood compatibility shall be evaluated by the U.S. Army Soldier and Biological Chemical Command (SBCCOM)/Edgewood Chemical Biological Center (ECBC) personnel. An example of an agent-certified hood is the one developed by the Army for the Chemical Stockpile Emergency Preparedness Program (CSEPP) for use with powered air-purifying respirators (PAPRs). This hood (Purchase Description EA-H-1 881) was designed to accommodate full-facepiece commercial PAPRs equipped with large one-piece panoramic lenses. The hood is constructed of a lightweight butyl coated nylon cloth (reference MIL-C-51251). Another example is the hood developed for use with self-contained breathing apparatus (SCBA) to be used in conjunction with Modified Level A. The Modified Level A hood is constructed of a heavier weight butyl coated nylon cloth (reference MIL-C-12189). Hoods made of materials not previously agent-certified shall be tested for permeation resistance against liquid chemical agent challenges of HD, GD, VX, and L at a challenge density of 12 g/m<sup>2</sup>. Twenty-two swatches shall be randomly selected from a given production lot of the hood material and tested with each agent. All swatches will be tested in accordance with closed-cup test methods for nonporous materials of TOP 8-2-501 for 4 hours at a temperature of 90 °F.

2. Mustard and Lewisite Operations: Respirators proposed for use in operations that involve the potential for low-level (0.003 mg/m<sup>3</sup> or lower) exposure to mustard or lewisite shall be NIOSH-certified for protection against organic vapors and hydrogen chloride (i.e., respirators equipped with NIOSH-certified combination organic vapor/acid gas filters). The filters shall be tested in accordance with the DMMP gas life test plan for organic vapor filters, above.

3. Particulate Exposure Hazards: Respirators to be worn for protection against chemical agent aerosol and/or respirable industrial particulate hazards (e.g. dust, fumes, and mists) shall be equipped with the appropriate NIOSH-certified particulate combination filters. The class and filtration efficiency level of the filter (i.e., particulate filter type) shall be selected based on the contaminant exposure hazard anticipated (e.g. asbestos, oil mist, toxic metal fumes, etc). The combination filters shall be tested in accordance with the DMMP gas life test plan for organic vapor filters, above.

### **Section C. Instructions for Using the Commercial Respirator Test Matrix**

1. The information described above provides the test requirements that commercial NIOSH-certified full-facepiece respirators must undergo before obtaining Department of the Army (DA) approval for use. Approval by HQDA Office of the Director of Army Safety (ODASAF) and HQDA Office of the Surgeon General (OTSG) will be based on

whether test results are adequate to authorize the respirator for conditions outlined in the "use scenario." The "use scenario" shall be composed of information describing how the respirator will be used, i.e., the specific type of operation.

2. The manufacturer of the commercial respirator may perform these tests to gain the Army's approval to use their respirator in the "use scenarios."
3. All respirators must be tested as specified above, unless HODA ODASAF and HQDA OTSG have approved a deviation from this requirement.
4. Each installation/requester will be responsible for obtaining all maintenance support, i.e., logistics and training. It is recommended that this type of support be made part of the purchase contract with the respirator manufacturer. Innovative approaches, such as two installations purchasing the same respirator and sharing maintenance support, are encouraged.

5. Approval Process:

a Each requester shall forward all test data and the "use scenario" to HQDA GDASAF. The HODA ODASAF will forward the request to the Chemical Agent Safety and Health Policy Action Committee (CASHPAC) which has a working group established to review the submitted information. The working group will provide a recommendation to the CASHPAC, which will review and forward a recommendation to HODA ODASAF. HODA ODASAF will staff the recommendation with the HODA OTSG before granting approval/ disapproval to the installation/requester.

b. Required Information:

1) Each installation/requester will prepare and submit a detailed "use scenario." The use scenario will include the following:

- a) Type, duration, and frequency of operations performed (i.e., work activities).
- b) Types and potential airborne concentrations of chemical agents which may be involved.
- c) Types and potential airborne concentrations of commercial chemicals involved.
- d) Type of near real-time monitoring that will be conducted during operations.
- e) Steps that will be taken should the monitor alarm.

Whether or not there is potential for contact with liquid chemical agents

g) A risk assessment/ hazard analysis, which was developed for the specific use scenario." A detailed scenario allows each installation/ requester to choose a respirator that meets their requirements. 'Commercial respirators may only be used in low-level chemical agent atmospheres which do not exceed the MUC stated above; therefore, accurate continuous near real time monitoring with alarm is essential.

2) All respirator be submitted. Additionally, a statement certifying that the test matrix was followed without test results (raw data) will deviations will be submitted.

3) A technical point of contact that can answer questions regarding the installation/requester's submission will be provided.

#### **Section D. Preparation Guide for Commercial Respirator Request Submission**

1. Title of Request.

2. Respirator Description. Completely describe the respirator. Include the type of filter(s), the respirator's capabilities, and the NIOSH certification number

3. Use Scenario(s). Fully describe how the respirator will be used, to include the information in section C.5.b.

4. Spares and Repairs. Discuss your plan for maintaining the respirators.

5. Test Summary.

a. Discuss the results of all testing. Mention that the respirator is NIOSH-certified and include a copy of the manufacturer's statement of NIOSH-certification.

b. Discuss the DMMP testing. Provide the test data and discuss the suitability of the respirator for the type of work to be performed. Also discuss any limitations based on the test data.

c. Discuss the chemical agent swatch tests for a protective hood, if applicable (see Section A, para 1, above). Be certain that the testing performed on the hood material matches the use scenario. For instance, if your scenario has the potential for exposure to liquid lewisite then you must have test data that demonstrates the effectiveness of the material to protect against that hazard. You should obtain a copy of the test data (if already performed) from the hood manufacturer and review it for applicability. If additional testing needs to be performed then discuss the results of that testing (see Section A, para 1, above).

6. Hazard Analysis. A hazard analysis of the use scenario must be performed. If the use scenario has a standing operating procedure (SOP) then there should be a hazard analysis for that SOP. This should be included.

7. Test Data. If you are using existing test data then you should indicate that here, otherwise all of the test data must be forwarded as an enclosure.